PROC. ENTOMOL. SOC. WASH.
91(3), 1989, pp. 461–467

POLYMERUS CASTILLEJA, A NEW MIRINE PLANT BUG FROM CALIFORNIA AND OREGON, WITH REMARKS ON GENERIC CHARACTERS OF THE GENUS *POLYMERUS* HAHN (HETEROPTERA: MIRIDAE)

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Abstract.—The new species, ***Polymerus castilleja***, is described and distinguished from other *Polymerus* species. A male dorsal habitus and illustrations of the genitalia of both sexes are presented. The small hyaline right paramere and the deeply cleft secondary gonopore of the male genitalia, and the obsolete dorsal structure and median process of the female genitalia are perceived to be synapomorphic for species of the genus *Polymerus*.

Key Words: Heteroptera, Miridae, *Polymerus*

Curation of the *Polymerus* Hahn holdings in the collections of the American Museum of Natural History revealed 115 specimens of a previously undescribed species. All the specimens of this taxon were taken from localities in California and Oregon on Indian paintbrush, and possessed marked sexual dimorphism and enlarged claw bases.

All measurements are in millimeters. A list of abbreviations of the specimen depositories are in the Acknowledgments.

Polymerus castilleja, NEW SPECIES
Figs. 1–11

Diagnosis.—Distinguished from all other *Polymerus* species by the enlarged claw base (Figs. 2, 3).

Description.—Male. **Dorsal aspect.** Figure 1. Total length 4.40–5.40, length from apex of tylus to cuneal fracture 3.10–3.90; coloration variable, ranging from—dark specimens with head, antenna, pronotum, mesoscutellum, scutellum, clavus, anterior half of embolium, distal two-thirds of corium interiad of radius, and paracuneus black, with frons mesially, vertex mesially and contiguous with eye, carina entirely, scutellum apically, embolium distally, distal one-third of corium mesad of radius, corium laterad of radius, cuneus, and veins of membrane testaceous to light fuscous; to—light specimens with base color orange or red testaceous with dark color restricted to tylus, lora, juga apically, frons with 'U' shaped marking mesially, temporal area peripherally, collum, first antennal segment apically and basally, second segment apically, callus and posterior lobe of pronotum diffusely, mesoscutellum mesially and laterally, small basomedial dash on scutellum, clavus interiad of claval vein, corium diffusely distally between cubitus and radius and membrane; vestiture with golden, recumbent, sericeous setae, and black, suberect, simple setae on corium and cuneus distolaterally; surface structure smooth, except for weak to moderately transversely rugulose pronotum and scutellum. **Head.** Triangular in dorsal view; Width across eyes 0.95–1.00, interocular width 0.41–0.43; tylus produced, anteocular length 0.30–0.33; antennal fossa contiguous with eye; eye large,

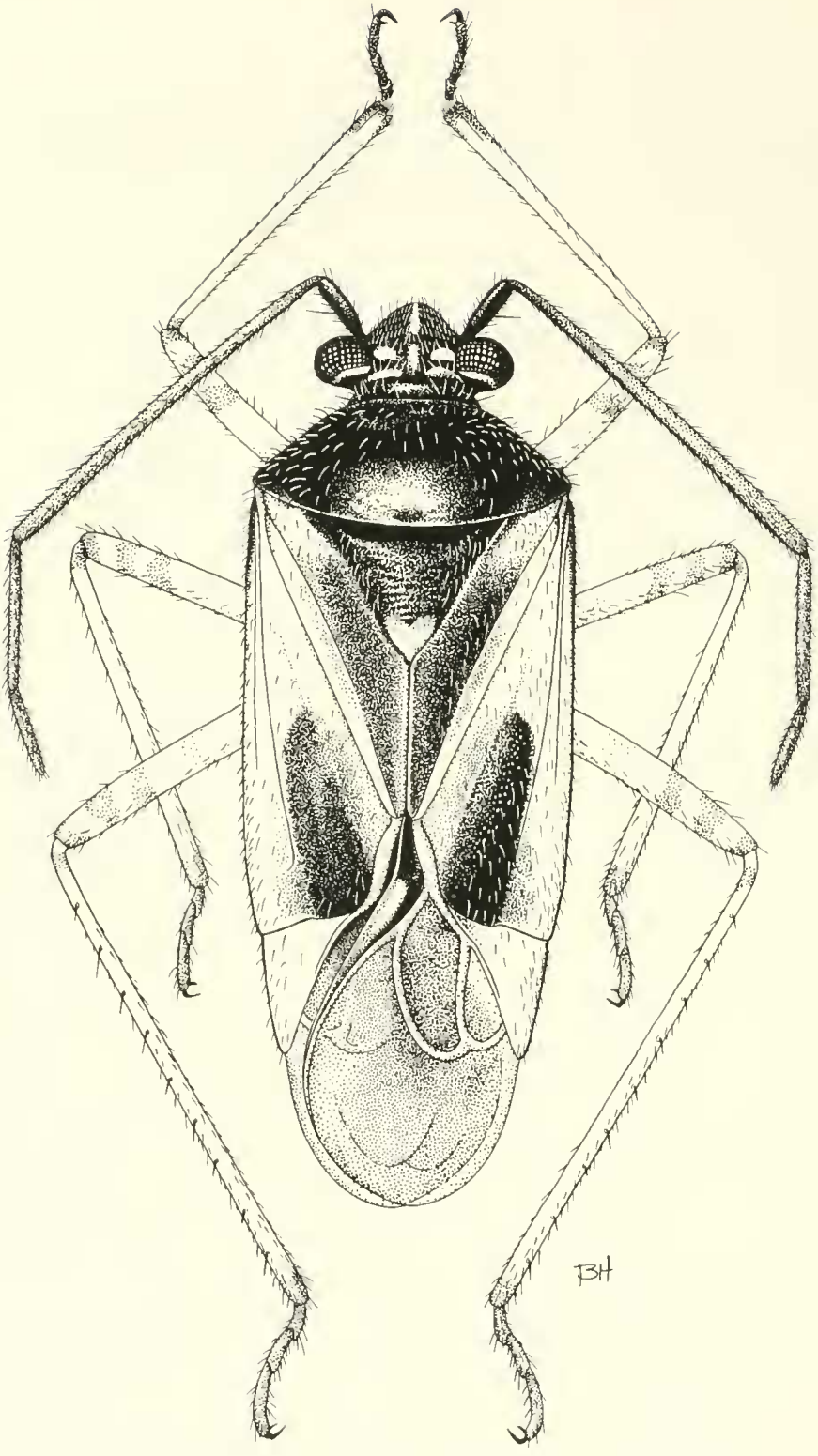
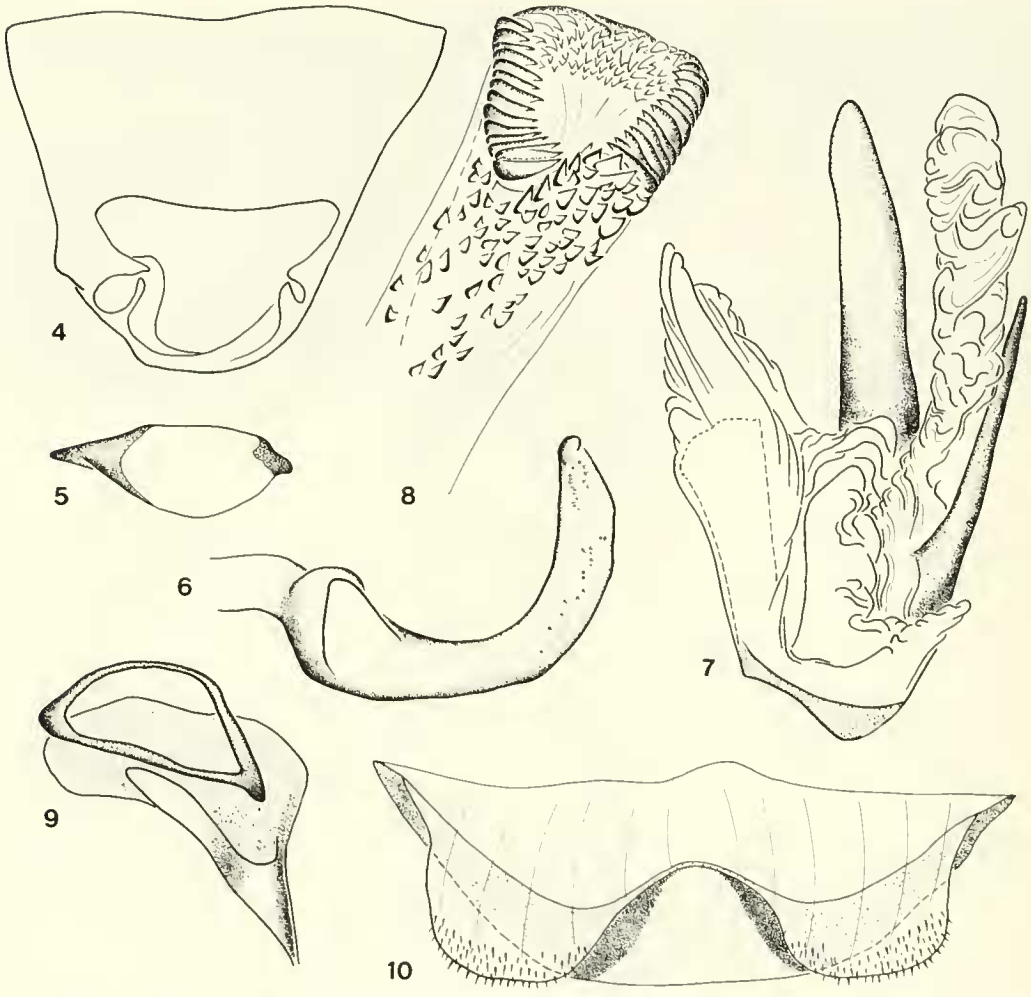


Fig. 1. *Polymerus castilleja*, dorsal habitus of male (28×).

Figs. 2, 3. *Polymerus castilleja.* Pretarsal structures (49×). 2, End on view. 3, Lateral view.

emarginate anteriorly, ventral margin extending ventrad of fossa in lateral view; antenna beset with fine, fuscous to black, suberect, simple setae, length of segment I 0.35–0.41, II 1.70–2.05; length of labium 2.30–2.63, reaching fourth to sixth abdominal sternite. **Pronotum.** Trapeziform in dorsal view; posterior width 1.40–1.64; posterior margin broadly curved, lateral margin rounded; callus smooth and weakly produced. **Hemelytra.** Macropterous, subparallel sided, sometimes tapered posteriorly in dorsal view. **Legs.** Tibiae longer than femora; color variable—light specimens with coxae, trochanters, and femora on basal half and apically testaceous, femora with diffuse stripes, tibiae, and first and second tarsal segments orange red, third segment and claws black;—dark specimens with coxae and femora with diffuse spots or stripes and apically, tibiae narrowly apically and basally, and tarsi dark fuscous to black; claws broad, strongly produced basally (Figs. 2, 3). **Ventral aspect.** Color variable ranging from black ground color with proepisternum, propleura, and sternum entirely, epimeron bordering coxae, and posterior edge of evaporative area of peritreme testaceous, and with band ventrad of abdominal spiracles red fuscous—to testaceous ground color with proepeisternum basally, propleura medially, sternum mesially, abdominal sternites laterally and mesially dark fuscous or black. **Genitalia.** *Genital capsule:* With broad, truncate, and apically spinose tubercle dorsolaterad of left paramere insertion (Fig. 4). *Left paramere:* Broadly 'U' shaped, surface without tubercles or spines; shaft extending beyond sensory lobe in lateral view; sensory lobe small, flattened on lateral surface; arm longer than shaft; shaft slightly compressed, broader than cylindrical arm, tapering to rounded apex (Fig. 6). *Right paramere:* Small, ovoid, with only apex and base entirely sclerotized, median portion hyaline; apex with small tubercle (Fig. 5). *Vesica:* Ductus seminis: Cylindrical, gradually expanded toward gonopore. Secondary gonopore: aperture with diffuse spinulae, incomplete, left side with deep fissure (Fig. 8). Membrane: Basal sclerite encircling base of membrane, projecting posteriad of ductus, and extending distally to form a thinly sclerotized lobe of the membrane; two lobal sclerites, one short and needlelike, one much longer, broader and clawlike (Fig. 7); portion of membrane adjacent to gonopore with surficial spiculae which merge with aperture of gonopore (Fig. 8).

Female.—Macropterous. Vestiture similar to, coloration usually lighter than (with dark markings much less extensive), and bodyform more robust than, male. **Measurements.** Total length 4.70–5.80, length



Figs. 4–10. *Polymerus castilleja*. Genitalic structures. 4–8, Male genitalia. 4, Genital capsule, dorsal view (55×). 5, 6, Parameres, lateral view (110×). 5, Right. 6, Left. 7, 8, Vesica. 7, Frontal view (110×). 8, Detail of secondary gonopore, frontal view (220×). 9, 10, Female genitalia (110×). 9, Right sclerotized ring, anterior view. 10, Posterior wall, posterior view.

from apex of tylus to cuneal fracture 3.55–4.40; width across eyes 0.98–1.15, interocular width 0.45–0.54; anteocular length 0.31–0.43; length of antennal segment I 0.35–0.40, II 1.60–2.08; length of labium 2.40–2.88, reaching fourth to sixth sternite; posterior width of pronotum 1.60–2.03. **Genitalia.** *Sclerotized rings:* Separate, subtriangular, moderate size. Dorsal labiate plate: Small, adhering and following curvature of ramae anteriad, attaining lateral margins of rings in dorsal view. Ventral labiate plate: Not spanning rings, subquadrate, slightly shorter than rings in dorsal view (Fig. 9). *Posterior wall:* Inter-ramal sclerite: Narrow, elongated laterally, sometimes disarticulated medially. Median process and dorsal structure: Obsolete. Inter-ramal lobes: Large, crescent shaped, extending ventrad to even with ventralmost portion of dorsal labiate plate in posterior view; surface structure with needlelike spiculae (Fig. 10).

Etymology.—Named after the genus of the host plant.

Holotype ♂.—UNITED STATES. **Oregon.** *Linn Co.*, H. J. Andrews Experimental Forest, 1 mi N of Frissel Pt., July 28, 1981, coll. G. M. Stonedahl, ex *Castilleja* sp.; deposited at AMNH.

Paratypes.—UNITED STATES. **California:** *Alpine Co.*, Ebbetts Pass, Aug. 6, 1974, F. G. Andrews, K. S. Corwin 1♀ (CAFA). *Modoc Co.:* 3 mi S of Bug Station, Hwy. 139, June 20, 1956, J. Schuh, sweeping *Castilleja* sp. 13 ♂, 9 ♀ (OSU); Fandago Pass Summit, July 3, 1979, 1890 m, R. T. Schuh & B. M. Massie, ex *Castilleja* sp. 9 ♂, 13 ♀ (AMNH). *Shasta Co.:* 1 mi S of Jct. of Rts. 89 & 299, 1219 m, July 9, 1980, R. T. Schuh & G. M. Stonedahl, ex *Castilleja applegatei* Fern. var. *fragilis* (Zeile) N. Holmgren 11 ♂, 32 ♀ (AMNH, CAS); "same locality and host," G. Stonedahl 11 ♂, 7 ♀ (AMNH). *Sierra Co.*, Sierraville, June 28, 1966, C. E. Hawkins 1 ♂, 1 ♀ (OSU). *Siskiyou Co.*, 2.5 mi N of Medicine Lk. on Medicine Lake Rd., July 18, 1985, G. M. Stonedahl & J. D. McIver, ex *Castilleja* sp. 5 ♂, 3 ♀ (AMNH). **Oregon:** *Jackson Co.*, Siskiyou Summit on I-5, July 4, 1982, T. J. Henry & G. M. Stonedahl, ex *Castilleja* sp. 4 ♂, 2 ♀ (AMNH); "same label data," 4300 ft. 6 ♀ (USNM). *Klamath Co.*, Bly Mt., June 14, 1958, J. Schuh 1 ♂ (OSU). *Lake Co.:* Summer Lake: June 16, 1938, Grey & Schuh 1 ♂, 1 ♀ (AMNH); Aug. 16, 1939 1 ♀ (AMNH); "same date," Schuh & Scott 1 ♀ (AMNH). Warner Cyn. nr. Lakeview roadside, 2 mi E of Hwy. 395, 5450 ft., July 19, 1971, Lattin 1 ♀ (OSU). *Linn Co.:* "with same label data as holotype," 9 ♂, 3 ♀ (AMNH, OSU); Monument Peak, 8 mi ESE of Gates Summit, 4725 ft., June 16, 1960, J. D. Lattin 1 ♂ (OSU).

Additional specimens.—**California:** *San Luis Obispo Co.*, Arroyo Grande Creek, SW

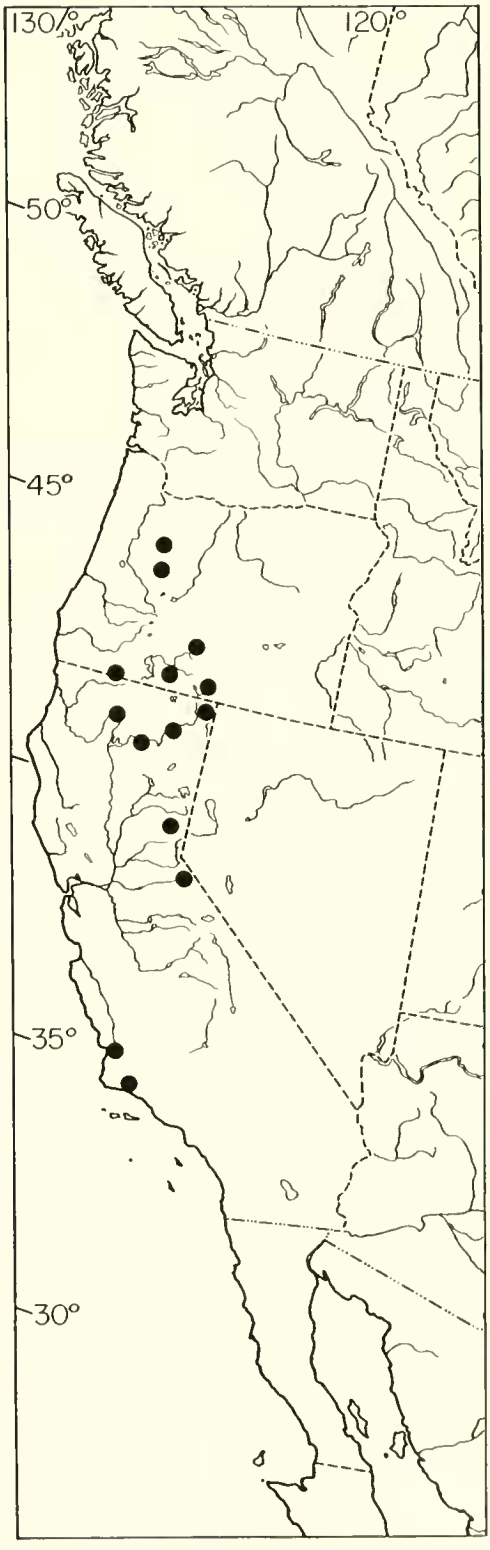


Fig. 11. Distribution of *Polymerus castilleja*.

of San Luis Obispo, ±160 m., May 18, 1985, R. T. Schuh & B. M. Massie, ex grasses and forbs 1 ♀ (AMNH). *Santa Barbara Co.*, Upper Oso Cmpgrd., off Rt. 154, 310 m., May 7, 1985, R. T. Schuh & B. M. Massie 1 ♀ (AMNH). These two specimens were excluded from the paratype series because they were not associated with male specimens, and were collected at localities removed far to the southwest of the paratypic localities.

Hosts.—All specimens where collected on either *Castilleja* sp. or *C. applegatei* Fern. var. *fragilis* (Zeile) N. Holmgren (Scrophulariaceae). Hitchcock and Cronquist (1973) summarized the distribution of *applegatei* var. *fragilis* as occurring in sagebrush (*Artemisia* spp.) and open coniferous wooded slopes in central Idaho, across eastern Oregon to the southern Cascades and south to northern Nevada and eastern California.

Distribution.—The Cascade region of westcentral Oregon south to the Sierra region of northern California. The true range of *castilleja* may be more extensive because, as noted above, the range of at least one of its host plants is more widespread than presently known for the plant bug (Fig. 11).

Discussion.—There are no keys to the *Polymerus* species which occur within the distributional range of *castilleja*. *Polymerus castilleja* keys to *hirtus* Knight in Kelton (1980), and *basalis* (Reuter) in Knight (1941). However, *castilleja* is easily separated from these and all other *Polymerus* species by the enlarged clawbase. Additionally, the labium of *castilleja* is longer (2.30–2.88) than either *hirtus* (1.75–1.89) or *basalis* (less than 2.30), and it is questionable whether *basalis* or *hirtus* actually occur within the range of *castilleja*.

Polymerus basivittis (Reuter) was collected along with *castilleja* on Indian paintbrush at the H. J. Andrews Experimental Forest, Linn County, Oregon and Fandango Pass, Modoc County, California. These two species are distinguished by the length of the labium and body conformation in addition to the different claw structure. The labium of *basivittis* barely reaches the metacoxae, whereas the labium of *castilleja* reaches from the fourth to the sixth abdominal sternite. Both sexes of *basivittis* are compact, ovoid bugs, while the sexes of *castilleja* are dimorphic with the males elongate. Kelton (1980) reported that *basivittis* has been collected on the widespread *Galium boreale* L. (Rubiaceae).

Superficially the female of *castilleja* has the appearance of *robustus* Knight. However, the latter species is distributed in southern California and possesses a labium which barely reaches the metacoxae.

Schwartz (1987) included a preliminary analysis of the genitalic attributes of many representative mirine genera (234 species encompassing 110 genera, including all the North American genera). In light of that study and from character information gleaned from several species of *Polymerus* dissected for the present paper, I will enumerate what I believe are autapomorphic genitalic characters for the genus. I examined the genitalia of both sexes of the following species: *basivittis*, *basalis* (Slater 1950: pl. 3, fig. 5), *diffusus* (Uhler), *nigritus* (Fallén), and *testaceipes* (Stål). The male genitalia of three additional species were examined only through published illustrations: *atacamensis* Carvalho and Carpintero (Carvalho and Carpintero 1986, figs. 11, 13), *chrysopsis* Knight (Kelton 1959, fig. 32), and *peruanus* Carvalho and Meléndez (Carvalho and Meléndez 1986, fig. 6).

Polymerus seems to be diagnosed by these characters:

(1) The right paramere is relatively small for a mirine, and only sclerotized at the apex and base, with the remainder of the paramere hyaline (Fig. 5). This construction was also noted by Kelton (1959) and illustrated by Wagner (1973: fig. 324 b, e, h, l, o) for *asperulae* (Fieber), *brevicornis* (Reuter), *microphthalmus* (Wagner), *palustris* (Reuter) and *unifasciatus* (Fabricius).

(2) The secondary gonopore is modified from the simple coil-like, uninterrupted, ap-

erture of many mirine genera to a deeply notched aperture with strong concentric rings of minute spinulae (Fig. 8). The spinulae of the gonopore are intermixed with the spinulae of the adjacent portion of the vesical membrane.

(3) The dorsal structure and median process of the posterior wall are usually obsolete and flattened in the plane of the interramal sclerite, respectively (Fig. 10).

These genitalic features further define *Polymerus,* which is otherwise inadequately diagnosed as medium sized, finely punctate member of the Mirini, with densely distributed vestiture of shining light to golden sericeous simple setae. The hypothesis of the genitalic autapomorphies of *Polymerus* is tentative, as an understanding of the distribution of the features listed above within the tribe is limited.

Acknowledgments

I thank the following individuals for providing material from collections in their care: A. Asquith and J. D. Lattin, Systematic Entomology Laboratory, Oregon State University, Corvallis (OSU); T. J. Henry, Systematic Entomology Laboratory, USDA, % National Museum of Natural History, Washington, D.C. (USNM); and R. T. Schuh, American Museum of Natural History, New York (AMNH). I thank B. Hall, Corvallis, Oregon, for the fine illustration of the adult male of *castilleja* and J. D. Lattin, through funds provided by NSF BSR-8514325, for providing the financial support for it. I thank T. J. Henry, J. D. Lattin, R. T. Schuh and an anonymous reviewer for reading and commenting on the manuscript. Financial support for field work and technical assistance was received from NSF Grants DEB 81-13401 and BSR 86-06621 to R. T. Schuh, AMNH.

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